This listing of claims will replace all prior versions, and listings, of claims in the application:

## **Listing of Claims:**



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- 1. (currently amended) A <u>computer-implemented</u> method <del>for the</del> identification of <u>identifying whether a test subject is a systemic autoimmune disease in a test subject suspected of suffering from an otherwise unidentified one or more systemic autoimmune <u>diseases</u> disease selected from the group consisting of systemic lupus erythmatosus, scleroderma, Sjögren's syndrome, polymyositis, dermatomyositis, CREST, and mixed connective tissue disease, said method comprising:</u>
  - (a) receiving a test data set for the test subject, wherein the test data set is obtained from a biological sample of the test subject and wherein the test data set has values representing levels of a plurality of autoantibodies, analyzing a single biological sample from said test subject for the presence and amounts of a plurality of autoantibodies to produce a test data set;
  - (b) storing a plurality of comparing said test data set to a library of reference data sets, each reference data set obtained from a biological sample of a reference subject known to have a systemic autoimmune disease of known identity, wherein each reference data set has values representing levels of the plurality of autoantibodies, and wherein each reference data set is associated with one or more of said systemic autoimmune diseases; and
  - (c) comparing the test data set and the reference data sets by applying pattern recognition means selected from the group consisting of a k-nearest neighbor process analysis, multi-linear regression analysis, Bayesian probabilistic reasoning, and principal component analysis to produce a statistically derived decision indicating whether the which systemic autoimmune disease said test subject is suffering from one or more of said systemic autoimmune diseases.

1	2. (currently amended) A method in accordance with claim 1 in which said			
2	test subject is suffering from two otherwise unidentified systemic autoimmune diseases, and sto			
3	(c) comprises applying pattern recognition means to produce produces a statistically derived			
4	decision indicating which two systemic autoimmune diseases whether said test subject is			
5	suffering from two of said systemic autoimmune diseases.			
1	3. (canceled)			
1	4. (canceled)			
1	5. (original) A method in accordance with claim 1 in which said plurality o			
2	autoantibodies numbers from 10 to 100 autoantibodies.			
1	6. (original) A method in accordance with claim 1 in which said plurality o			
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1	7. (previously presented) A method in accordance with claim 1 in which			
2	said plurality of autoantibodies comprises antibodies to at least fifteen of the following antigen			
3	SSA 60,			
4	SSA 52,			
5	SSB 48,			
6	Sm BB',			
7	Sm D1,			
8	RNP 68,			

. 9	RNP A,
10	RNP C,
11	Fibrillarin,
12	Riboproteins P0, P1, and P2,
13	dsDNA,
14	Nucleosome,
15	Ku,
16	Centromere A,
17	Centromere B,
18	Scl-70,
19	Pm-Scl,
20	RNA-Polymerases 1, 2, and 3,
21	Th,
22	Jo-1,
23	Mi-2,
24	PL7,
25	PL12, and
26	SRP.

1 8. (previously presented) A method in accordance with claim 1 in which

said plurality of autoantibodies comprises antibodies to each of the following antigens:

3 SSA 60,

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4 SSA 52,

5 SSB 48,

6 Sm BB',

7 Sm D1,

8 RNP 68,

9 RNP A,

10 RNP C,

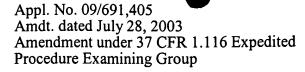
,11	Fibrillarin,
12	Riboproteins P0, P1, and P2,
13	dsDNA,
14	Nucleosome,
15	Ku,
16	Centromere A,
17	Centromere B,
18	Sc1-70,
19	Pm-Scl,
20	RNA-Polymerases 1, 2, and 3,
21	Th,
22	Jo-1,
23	Mi-2,
24	PL7,
25	PL12, and
26	SRP.

- 9. (currently amended) A method in accordance with claim 1 in which said library of reference data sets represent represents from 100 to 10,000 biological samples from reference subjects known to have systemic autoimmune diseases of known identity.
- 1 10. (currently amended) A method in accordance with claim 1 in which said 2 library of reference data sets represent represents from 200 to 2000 biological samples from 3 reference subjects known to have systemic autoimmune diseases of known identity.

1	12. (original) A method in accordance with claim 1 in which said biological		
2	sample from said test subject is a member selected from the group consisting of serum, plasma,		
3	urine, and cerebrospinal fluid.		
1	13. (original) A method in accordance with claim 1 in which said biological		
2	2 sample from said test subject is serum.		
1	14. (currently amended) A method in accordance with claim 1 in which step		
2	(a) is performed the test data set is based on analysis by immunoassay.		
1	15. (currently amended) A method in accordance with claim 1 in which step		
2	(a) is performed the test data set is based on analysis by immunoassay with fluorescence		
3	detection.		
1 - 2	16. (currently amended) A method in accordance with claim 1 in which said one or more systemic autoimmune disease is diseases consists of systemic lupus erythmatosus.		
1	17. (New) A computer-implemented method of diagnosing whether a test		
2	subject is suffering from one or more systemic autoimmune diseases selected from the group		
3	consisting of systemic lupus erythmatosus, scleroderma, Sjögren's syndrome, polymyositis,		
4	dermatomyositis, CREST, and mixed connective tissue disease, said method comprising:		
5	(a) receiving a test data set for the test subject, wherein the test data set is		
6	obtained by analysis of a biological sample of the test subject and wherein the test data		

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set has values representing levels of each of a plurality of autoantibodies;



(b) storing a plurality of reference data sets to a database, wherein each reference
data set is obtained by analysis of a biological sample of a reference subject known to
have a systemic autoimmune disease of known identity, wherein each reference data set
has values representing levels of each of the plurality of autoantibodies, and wherein each
of the reference data sets is associated with one or more of said systemic autoimmune
diseases; and

- (c) applying a k-nearest neighbor process to the test data set and the reference data sets from the database to produce a statistically derived decision indicating whether the test subject is suffering from one or more of said systemic autoimmune diseases.
- 18. (New) The method of claim 17, wherein the autoantibody levels in the test and reference data sets are determined using the same multianalyte analysis tests.

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